SIEMENS

SIREMOBIL

SP

Maintenance Instructions

SIREMOBIL

Multiroom Connection

The protocol SPR2-130.105.02.03.02 is required for these instructions

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Document revision level

The document corresponds to the version/revision level effective at the time of system delivery. Revisions to hardcopy documentation are not automatically distributed.

Please contact your local Siemens office to order current revision levels.

Disclaimer

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1 General information

1.1 Requirements

The requirements described in chapter 1 of the service instructions also apply to maintenance.

1.2 Required documents

• Safety information according to ARTD, part 2	
• Maintenance protocol	SPR2-130.105.02..

In addition to the documents listed above, the service documents for SIREMOBIL systems integrated in multi-room operation are also required.

1.3 Required tools, measurement and auxiliary devices

NOTE

The indicated articles are listed in the STC (Service Tools Catalog) unless otherwise stated (the STC is a component of the Spare Parts Catalog), except for those items identified with "*".

Tool	Material no.:
• Standard tool kit*	
• Protective conductor meter	44 15 899 RV090
• 25 mm AL measuring stand, type 26765 acc. to DIN 6868 Part 50 or	
- 1.2 mm Cu from the X-ray filter set	97 98 596 G5321
- 17 µm strips	11 67 662 G5247
• Dynamic test kit or - TV dynamic test - Bracket - Veiling glare test - Capillary test - Heart contour diaphragm	37 90 156 X 1963 37 90 164 X 1963 87 13 901 X 1963 87 09 743 X 1963 37 90 180 X 1963 37 90 172 X 1963
• Service PC	
• Precision X-ray filter	99 00 598 XE999
• Serial interface cable for service PC or	99 00 440 RE999 96 60 978 RE999
• Set of resolution tests	28 71 820 RE999
• 2.1 mm Cu precision X-ray filter	99 00 598 XE999
• Set of X-ray filters 10 x 0.3 mm Cu	44 06 120 RV090

1.4 Emphasized text

⚠DANGER	**DANGER indicates when there is an immediate danger that l e a d s to death or serious physical injury.**
⚠WARNING	**WARNING indicates a risk of danger that m a y l e a d to death or serious physical injury.**
⚠ CAUTION	**CAUTION used with the safety alert symbol indicates a risk of danger that leads to slight or moderate physical injury and/ or damage to property.**
NOTICE	**NOTICE used without the safety alert symbol indicates a risk of danger that if disregarded leads or may lead to a potential situation which may result in an undesirable result or state other than death, physical injury or property damage.**

Fig. 1: Safety Notes

1.5 Safety information and protective measures

1.5.1 General safety information (in existing documents)

⚠WARNING

Danger of injuries, death or material damage.

Note

- **The product-specific safety notes in these instructions,**
- **The general safety information in TD00-000.860.01... and**
- **The safety information in accordance with ARTD Part 2.**
- **Non-compliance can lead to death, injury or material damage.**

1.5.2 General electrical safety information

⚠WARNING

Electrical safety!

Non-compliance can lead to severe injury or even death and material damage.

- **After opening the covers, the parts under voltage are accessible. To avoid danger, disconnect the system from the power supply prior to opening the covers. Disconnect the power plug.**
- **If an uninterruptible power supply (UPS) is installed in the system, the voltage output of the UPS must also be deenergized or the voltage output plug must be disconnected.**
- **If work has to be performed under electrical voltage, the general safety information according to TD00-000.860.01... must be complied with.**

⚠CAUTION

Electrical voltage!

Non-compliance can result in material damage.

- **When working on the system, ESD regulations must be observed.**

1.5.3 Radiation safety information

⚠WARNING

X-ray radiation!

Non-compliance can lead to illness, irreversible damage to body cells and the genotype, severe injury and even death.

When performing work on the system during which radiation must be released, the radiation protection directives and the rules for radiation protection according to ARTD 02.731.02 must be complied with.

- **Please note:**
- **Use available radiation protection devices.**
- **Wear radiation protection clothing (lead apron).**
- **Stay as far away as possible from the radiation source.**
- **Release radiation only if necessary.**
- **Set the radiation activity as low as possible. (low kV and mA values, short radiation time)**
- **Release radiation for as short a time as possible.**
- **Checks in which radiation must be released are identified by the radiation warning symbol.**

1.5.4 Mechanical safety information

⚠CAUTION

Risk of burns from hot parts or components! Non-compliance can result in minor to more severe burns, especially on the hands.

Parts and components (e.g., power components, cooling element, electromagnetic brakes) that can exceed 50 degrees Celsius during operation are accessible after the covers are opened.

- **To avoid burns, switch the system off prior to touching parts or components and allow at least 5 minutes of cooling.**

⚠CAUTION

Risk of injury from mechanical parts! Non-compliance can result in minor to more severe injury, especially to the hands.

Parts such as flat plugs, threaded bolts, cut-off cable ties and component edges that, if care is not taken, can cause crushing, abrasion and cuts to the skin, particularly to the hands, can be touched after the covers are opened.

- **Perform the required work with special care and attention to detail.**
- **If needed, wear work gloves.**

1.5.5 Safety information - risk of infection

⚠WARNING

Risk of infection due to pathogens! Non-compliance can lead to severe injury and even death.

This product can be contaminated by infected blood or other bodily fluids.

- ➪ **Avoid all contact with blood or other bodily fluids!**
- ➪ **Strictly observe the safety information in ARTD-002.731.37... regarding prevention of infectious diseases during customer service calls.**

1.5.6 Information on the protective conductor resistance test

The protective conductor resistance is to be measured, documented, and evaluated during maintenance.

NOTE

Evaluate the results by comparing the first measured value to the corresponding values documented during preceding maintenance procedures or safety checks.

A sudden or unexpected increase in the measured values may indicate a defect in the protective conductor connections - even if the limit value of 0.2 ohms is not exceeded.

(Protective conductor or contacts).

The measurement must be performed according to DIN VDE 0751, Part 1 (see ARTD Part 2). In this case the protective conductor resistance for all touchable conductive parts must be measured during the normal operating state of the system.

Make sure that control cables or data cables between the components of the system are not mistaken for a protective conductor connection.

During the measurement, the power cable and additional connection cables which also establish the protective conductor connection between parts of the system (e.g. monitor cable between C-arm chassis and monitor trolley) must be moved section by section to detect line breaks.

The protective conductor resistance must not exceed 0.2 ohms.

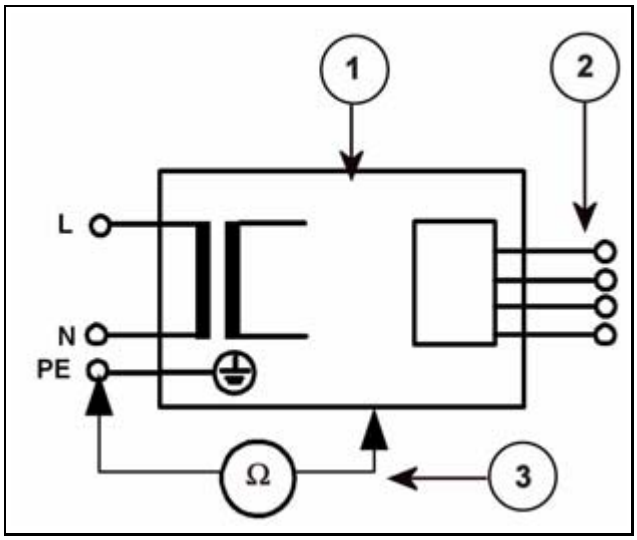

Fig. 2: Measuring circuit for measuring the protective conductor resistance in units/systems that are permanently connected to the power supply net (according to DIN VDE 0751-1:2001-10, Fig. C3).

Pos. 1 System

Pos. 2 Application part (not available)

Pos. 3 Measurement setup (integrated into measuring device)

The determined values, including the measuring points, must be recorded and assessed in the protective conductor resistance report.

The measuring procedure and the measuring device used (designation and serial number) are also to be documented.

1.5.7 Information on measuring the system leakage current

Units provided by the manufacturer for a fixed power line connection and connected as such do not require the system leakage current measurement if the protective measures for indirect touching of the heavy current system according to DIN VDE 0107 are effective.

1.6 Description of abbreviations

Abbrev.	Description
SI	Safety Inspection
SIE	Electrical Safety
SIM	Mechanical Safety
PM	Preventive Maintenance
PMP	Periodic Preventive Maintenance
PMA	Preventive Maintenance Adjustments
PMF	Preventive Maintenance, Operating Value Check, Function Check
Q	Quality Check
QIQ	Image Quality
QSQ	System Quality Check
SW	Software Maintenance

The steps identified by these abbreviations are part of the maintenance protocol and should be checked off upon completion.

NOTE

The sequence for complete maintenance and inspection is described on the following pages.

Each work step must be performed on an annual basis, if not otherwise specified.

1.7 Maintenance interval

12 months

2 Inspection of exterior and surroundings

2.1 Inspection of exterior

PMP Damage

- Check wall outlets for damage.
- Check monitor and power cables.

2.2 Inspection of surroundings

2.2.1 Power outlets

SIE Damage

SIE Line voltage

SIE Internal line impedance

- Inspect the power outlets used for system operation for damage.
- Measure the internal line impedance.

3 Safety inspection

3.1 Mechanical safety

SIM Covers

- Check the housing of the electronics cabinet.

SIM Monitors

- Check the monitor mounting.

SIM Keyboard

- Check the keyboard mounting.

SIM Warning labels

- Ensure that all required warning labels are attached and in good condition.
  - ➪ Replace any illegible labels.

SIM ID labels

- Ensure that all required ID labels are attached and in good condition.
  - ➪ Replace any illegible labels.

3.2 Electrical safety

SIE Cables and plugs

- Check visible system cables and plug connections for damage.

SIE Radiation indicators

- Switch the system on.
- Release fluoroscopy briefly.
  - ➪ The radiation indicator on the control panel of the SIREMOBIL stand, the radiation indicator on the monitor trolley, and the radiation indicators installed in the examination room must light up.
- Switch the system off.

SIE Power switch

Check the power-off and power-on switches (if applicable) on the SIREMOBIL.

SIE Protective conductor test

NOTE

The test of the on-site electrical installation to the terminals of the multi-room connection is not part of the safety checks of these maintenance instructions and must be performed by the operator at the required intervals in accordance with the relevant laws and standards.

The protective conductor test of a system without multi-room connection is not included in the safety checks of these maintenance instructions and must be performed during normal system maintenance.

NOTE

The protective conductor test of the multi-room connection is to be performed from the ground wire connection of the multi-room connection (in the electronics cabinet) to all touchable conductive parts (monitors/wall outlets).

The connection lines between the wall outlet, the C-arm chassis, and the CEE outlet, mounted in the electronics cabinet, are to be included in the test. During the measurements, the lines are to be moved section by section to detect line breaks.

The protective conductor resistance must not exceed 0.2 ohms.

NOTE

Observe the notes on the protective conductor test in these instructions.

- If covers were removed, they are to be reattached.
- Perform the protective conductor test according to ARTD-002.731.17... .
- The connection lines between the wall outlets, the C-arm chassis and possibly available power lines of permanently installed monitors or other externally installed components (printers, video recorder, etc.) are to be moved section by section during the protective conductor measurement to detect line breaks.

- The protective conductor resistance of 0.2 ohms must not be exceeded. The determined values, including the measuring points, must be recorded and assessed.
- The measuring procedure and the measuring device used (designation and serial number) are also to be documented.

NOTE

Evaluate the results by comparing the first measured value to the corresponding values documented during preceding maintenance procedures or safety checks.

A sudden or unexpected increase in the measured values may indicate a defect in the protective conductor connections - even if the limit value of 0.2 ohms is not exceeded.

(Protective conductor or contacts).

SIE Leakage current measurement

- Units provided by the manufacturer for a fixed power line connection and connected as such do not require the leakage current measurement if the protective measures for indirect touching of the heavy current system according to DIN VDE 0107 (replaced by DIN VDE 0100 Part 710) are effective.

4 Final result/quality inspection and maintenance

SIE Image quality (IQ) quick test

- Perform the IQ quick test according to the Image Quality Quick Test Instructions for SIREMOBIL.

PMP Maintenance

- Entire system: Touch up any paint damage as needed.

4.1 Final work steps

SIE Protective conductor test

SIE Protective conductor resistance

- Perform the protective conductor test while the system is closed according to ARTD-002.731.17. The protective conductor resistance may not exceed 0.2 ohms.

SIE Electronics cabinet

- Lock the electronics cabinet.

5 Changes to Previous Version

New template was used (DMS).